

The health of our waters is the principal measure of how we live on the land. —Luna Leopold

Findings

- Programs and partnerships have been established in Virginia to address watershed planning and management.
- Local communities benefit from state and federal programs that address water quality and watershed management.
- Many outdoor recreation activities are dependent upon watershed management to sustain natural resources and water quality.
- In 2002, of the Virginia streams monitored, Virginia's Department of Environmental Quality (DEQ) listed 4,318 stream or river miles as impaired. This is an increase of 1,484 miles since 1998 (www.deq.state.va.us/wqa/303d.html).
- Additional funding is needed to achieve the water quality goals of the Chesapeake 2000 multi-state Bay agreement and to meet water quality goals throughout Virginia. (www.naturalresources.virginia.gov/Initiatives/WaterCleanupPlan)



Healthy streams are dependent on watershed management practices. Photo by Irvine Wilson.

Recommendations

- State watershed management planning efforts should be incorporated into green infrastructure initiatives.
- Local planners and decision makers should incorporate green infrastructure into local watershed management plans.
- Encourage, nurture and recognize partnerships between local jurisdictions and nonprofit organizations working to facilitate land use planning and conservation options at a local level.
- Regional and local governments should protect watersheds by integrating watershed management planning with local land use ordinances and comprehensive plans.

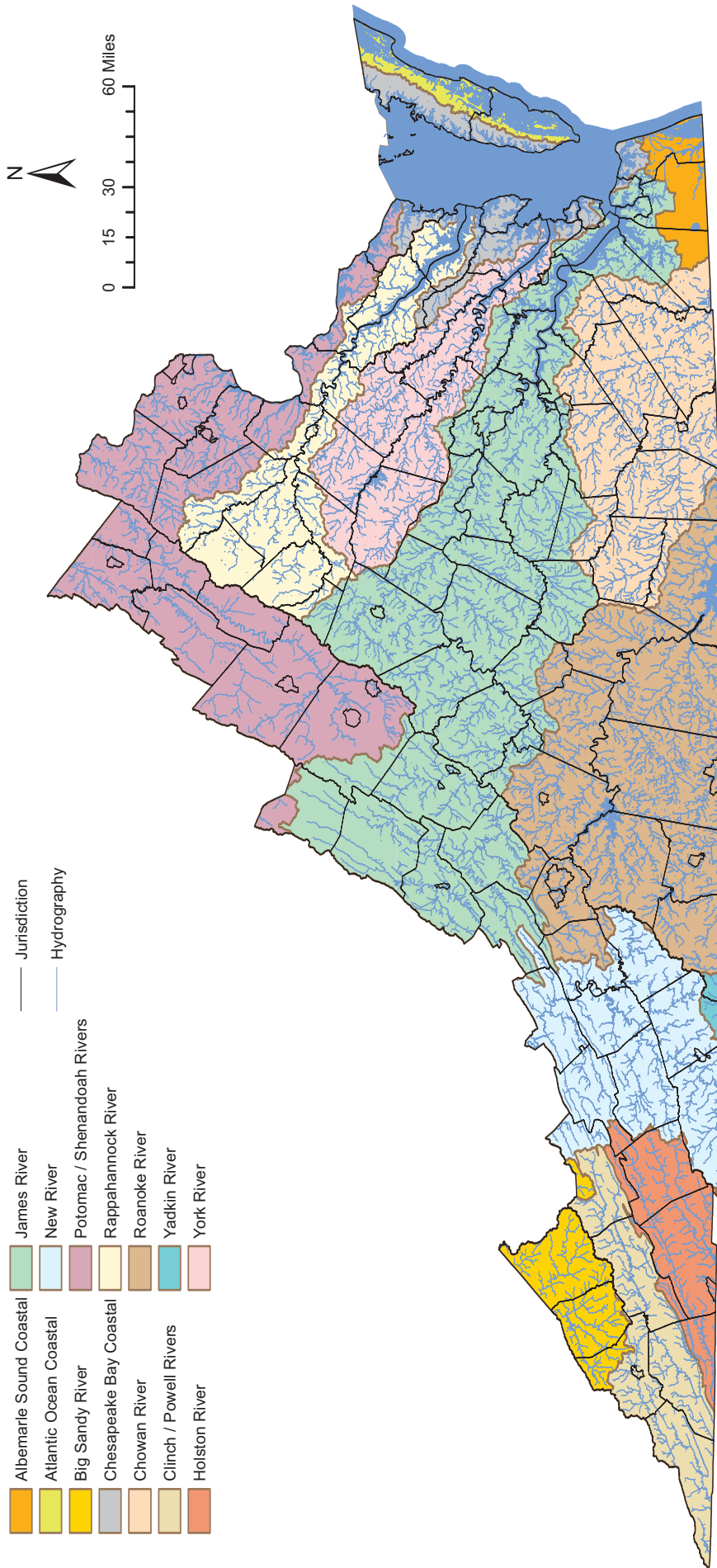
Importance of watershed planning and programs to outdoor recreation and conservation lands

To maintain and improve water quality and ensure that future generations have adequate water supplies, it is essential to understand and incorporate watershed protection into development planning using green infrastructure models and watershed planning. The enjoyment of popular outdoor recreation activities such as fishing, swimming and boating is dependent on access to clean and abundant waters. Streams and rivers in the Commonwealth should be available for primary contact recreation and should provide drinking water for existing and future populations.

Virginia watershed boundaries

All land in the Commonwealth is within a watershed. A watershed is simply the area of land that drains into a particular body of water. Bodies of water used to define a watershed may be a creek, pond, river, bay or ocean.

Virginia has defined 497 subwatersheds that make up the state's 14 major watersheds. These 14 watersheds



Data Sources:
 USGS - Hydrology
 VA-DCR - Hydrologic Units / Jurisdiction Boundaries

are divided into two larger watersheds, the Chesapeake Bay and the Southern Rivers. The Chesapeake Bay watershed includes the geographic area in the northern half of the state where all waters eventually drain to the Chesapeake Bay or Atlantic Ocean. The Southern Rivers watershed represents the lands draining the southern half of the state into the Albemarle-Pamlico Sound in North Carolina, or across the southwestern portion of the state into the Ohio River and then to the Mississippi River and the Gulf of Mexico.

www.dcr.virginia.gov/soil_&_water/wsheds.shtml

Southern Rivers watersheds

Albemarle Sound, Coastal
Big Sandy
Chowan
Clinch-Powell
Holston
New
Roanoke
Yadkin

Chesapeake Bay watersheds

Eastern Shore and Bayside Basins
Atlantic Ocean Coastal
James
Potomac-Shenandoah
Rappahannock
York

Watershed programs

The Department of Conservation and Recreation (DCR) has eight watershed field offices (www.dcr.virginia.gov/soil_&_water/swintro.shtml) providing support to local governments, soil and water conservation districts and communities. These offices support watershed program initiatives dealing with watershed planning, nonpoint source pollution removal, water quality related issues, conservation initiatives, education, outreach and training.

Southern watersheds field offices

Abingdon: Tennessee-Big Sandy Watersheds Office

252 W. Main Street, Suite 3
Abingdon, Va. 24210
Phone: (276) 676-5528
Fax: (276) 676-5527

Dublin: New River Watershed Office

P. O. Box 1506
Dublin, Va. 24084
Phone: (540) 643-2590
Fax: (540) 643-2597

Suffolk: Chowan-Albemarle Coastal Watersheds Office

1548 Holland Road
Suffolk, Va. 23434
Phone: (757) 925-2468
Fax: (757) 925-2388

Chesapeake Bay watersheds field offices

Clarksville: Roanoke Watershed Office

11632 Highway 15 South
Clarksville, Va. 23927
Phone: (434) 374-3648

Richmond: James River Watershed Office

101 N. 14th St., 11th Floor, Monroe Building
Richmond, VA. 23219
Phone: (804) 225-4468
Fax: (804) 371-0771

Staunton: Shenandoah Watershed Office

44 Sanger Lane, Suite 102
Staunton, Va. 24401
Phone: (540) 332-9991
Fax: (540) 332-8956

Tappahannock: York-Rappahannock Watershed Office

P. O. Box 1425
Tappahannock, Va. 22560
Phone: (804) 443-6752
Fax: (804) 443-4534

Warrenton: Potomac Watershed Office

98 Alexandria Pike, Suite 33
Warrenton, Va. 20186-2849
Phone: (540) 347-6420
Fax: (540) 347-6423

Watershed tools and technical assistance

DCR provides technical assistance, guidance and information on local and regional watershed management planning. As the lead agency for nonpoint source pollution control, DCR produced a DVD on watershed planning entitled *Catch the Watershed Wave, A Case Study on small watershed planning in two Virginia Communities*. The DVD encourages local planners to consider watershed boundaries and to include a wide range of economic, environmental and social factors when prioritizing goals. The DVD is a companion tool for watershed planning guidebook entitled, *Local Watershed Management Planning in Virginia: A Community Water Quality Approach*. This guidebook can be found online here:

www.dcr.virginia.gov/soil_&_water/documents/wshedguideb2b.pdf

A summary of programs and agencies that support watershed management are summarized below.

Virginia Water Quality Improvement Act (WQIA)

www.dcr.virginia.gov/soil_&_water/wqia.shtml

Through this program, DCR's regional watershed offices work with local governments to develop effective nonpoint source pollution reduction strategies. The Water Quality Improvement Act also established the Water Quality Improvement Fund that provides grants for a variety of water quality programs.

Chesapeake Bay Preservation Act

www.dcr.virginia.gov/chesapeake_bay_local_assistance

The Virginia General Assembly enacted the Chesapeake Bay Preservation Act in 1988. The Bay Act established a land use management program that is implemented by local governments pursuant to regulations promulgated by the state. The program focuses on reducing and preventing nonpoint source pollution from new development and redevelopment. The Division of Chesapeake Bay Local Assistance (CBLA) within DCR and the Chesapeake Bay Local Assistance Board are responsible for the implementation of the Act. CBLA addresses the impact of land use upon the waters that feed the Chesapeake Bay by working directly with local governments to develop and implement programs that are compliant with state law. The next phase of Chesapeake Bay Preservation Act implementation will lead to the incorporation of specific water quality protection measures, such as low impact development practices, into local zoning and subdivision ordinances. Part of this effort will

include the integration of watershed management planning into local comprehensive plans and ordinances.

Better Site Design is an initiative by DCR's Division of Chesapeake Bay Local Assistance that uses information compiled by the National Site Planning Roundtable to shift the focus of stormwater management away from traditional best management practices, such as stormwater ponds, as the sole means of treating pollutants from urban development. The Better Site Design program adapts 16 of the 22 model development principles developed through the National Site Planning Roundtable in an effort to help localities achieve the three general performance criteria of minimizing land disturbance, preserving indigenous vegetation and minimizing impervious cover to reduce the amount of pollution generated by new development. By reviewing site plans early on for opportunities to conserve trees, minimize the impacts of parking, promote open space development, reduce setback and street-width requirements, among others, communities can help reduce runoff and the pollutants reaching local waterways long before construction begins.

Stormwater management

www.dcr.virginia.gov/soil_&_water/stormwat.shtml

DCR's Stormwater Management Program seeks to protect water quality and property from damages caused by increased volume, frequency and peak rate of stormwater runoff. This program also protects resources from increased nonpoint source pollution carried by rainwater runoff.

Erosion and sediment control

www.dcr.virginia.gov/soil_&_water/e&s.shtml

DCR provides on-the-ground assistance to local staff and the private sector through a training and certification program. Staff members also oversee local programs through periodic evaluations to ensure that they control soil erosion, sedimentation, and nonagricultural runoff from land-disturbing activities.

Agricultural conservation practices

www.dcr.virginia.gov/soil_&_water/costshar.shtml

DCR provides funding, guidance and technical assistance to plan and install agricultural conservation practices in concert with Virginia's 47 soil and water conservation districts.

Nutrient management

www.dcr.virginia.gov/soil_&_water/nutmgt.shtml

DCR certifies private and public sector nutrient management planners. The program offers technical assistance to farmers, planners, universities and other state agencies to develop nutrient management plans, either on a voluntary basis or when required by state law.

Nonpoint source pollution biennial assessment and prioritization

www.dcr.virginia.gov/soil_&_water/npsassmt.shtml

DCR evaluates the potential for water quality degradation due to nonpoint source pollution on a hydrologic unit basis. To better target water quality improvement solutions, the assessment indicates where water quality degradation might have its greatest impact.

Riparian buffers

www.dof.virginia.gov/rfb/index.shtml

www.dcr.virginia.gov/soil_&_water/crep.shtml

www.dcr.virginia.gov/chesapeake_bay_local_assistance/ripbuff.shtml

The Virginia Department of Forestry (DOF) is the lead agency for tracking and promoting the preservation and establishment of riparian buffers statewide. DCR and its partners, through the conservation reserve enhancement program (CREP), promote the establishment of buffers on agricultural lands. In the portion of the state subject to the requirements of the Chesapeake Bay Preservation Act, buffers are required along perennial streams and other protected land features.



Monitoring the Tye River. DCR photo by Irvine Wilson.

Water quality and water supply

www.deq.virginia.gov

DEQ administers a number of water quality programs that focus on municipal and industrial discharges, Total Maximum Daily Load (TMDL) development and implementation, and water supply and wetlands protection. In addition, DEQ tests Virginia's rivers, lakes and tidal waters for over 130 different pollutants to determine whether the waters meet water quality standards that determine whether they are suitable for swimming, fishing or drinking. Waters that do not meet standards are reported to the U.S. Environmental Protection Agency (EPA) in the 303(d) Impaired Waters Report.

The segments of streams, lakes and estuaries that exhibit violations of water quality standards are found on DEQ's website at

www.deq.virginia.gov/tmdl.

Also, beach closures due to Virginia Health Department Advisories are found at:

www.vdh.virginia.gov/epidemiology/DZEE/BeachMonitoring

Soil and water conservation districts

www.vaswcd.org or

www.dcr.virginia.gov/soil_&_water/swcds.shtml

Soil and water conservation districts (SWCDs) were established in the 1930s to conserve soil resources, prevent soil erosion and prevent floods. In Virginia, 47 districts serve as local resources for citizens in nearly all of Virginia's counties, cities and towns. Since the mid-1980s, DCR has relied heavily on districts to help deliver many programs aimed at controlling and preventing nonpoint source pollution.

U.S. Department of Agriculture Natural Resources Conservation Service

www.nrcs.usda.gov

The Natural Resources Conservation Service (NRCS) provides technical and financial assistance to help agricultural producers and others care for the land. NRCS has six mission goals that include high quality, productive soils; clean and abundant water; healthy plant and animal communities; clean air; an adequate energy supply; and working farms and ranchlands. To achieve these goals, the agency implements three strategies:

- Cooperative conservation: seeking and promoting cooperative efforts to achieve conservation goals.

Virginia's Watershed Programs

- Watershed approach: providing information and assistance to encourage and enable locally led, watershed-scale conservation.
- Market-based approach: facilitating the growth of market-based opportunities that encourage the private sector to invest in conservation on private lands.

Homeowner programs

Stewardship education programs that focus on backyard gardens and horticulture as a recreational activity can incorporate environmentally friendly techniques.

Many state and nationally recognized efforts provide wildlife and water quality friendly education to the gardening community. Some links for further information on this topic include:

A Virginian's Year-Round Guide to Yard Care: Tips and Techniques for Healthy Lawns and Gardens
www.dcr.virginia.gov/soil_&_water/documents/yardcare.pdf

Virginia Cooperative Extension
www.ext.vt.edu/resources

Backyard Wildlife Habitat
www.ext.vt.edu/pubs/wildlife/426-070/426-070.pdf

Habitat at Home
www.dgif.virginia.gov/wildlife/habitat/habitat.asp

BayScapes for Wildlife Habitat
www.dgif.virginia.gov/wildlife/habitat/bayscapes.pdf

Backyard Conservation Wildlife Habitat
www.dgif.virginia.gov/wildlife/habitat/backyard-conservation.pdf

Native Plants for Conservation
Restoration and Landscaping
www.dcr.virginia.gov/natural_heritage/native-plants.shtml

National Wildlife Federation Backyard Habitat
www.nwf.org/backyard

Private and nonprofit watershed groups

Numerous nonprofit, regional and local watershed groups are active within each planning region. These groups are listed under the watershed information for each region in Chapter X. Specific watershed programs coordinated by The Nature Conservancy follow:

Clinch Valley Program

www.nature.org/wherewework/northamerica/states/virginia/preserves/art15030.html

Rivanna River Basin Commission

www.nature.org/wherewework/northamerica/states/virginia/news/news1614.html

Southeastern Virginia

Southern Rivers Program

www.nature.org/wherewework/northamerica/states/virginia/preserves/art15066.html

Chesapeake Rivers Program

www.nature.org/wherewework/northamerica/states/virginia/preserves/art2671.html

Green Sea Program

www.nature.org/wherewework/northamerica/states/virginia/preserves/art2694.html

Center for Watershed Protection

www.cwp.org

Founded in 1992, the Center for Watershed Protection is a nonprofit 501(c)3 corporation that provides local governments, activists and watershed organizations around the country with the technical tools for protecting some of the nation's most precious natural resources: our streams, lakes and rivers. The center has developed and disseminated a multidisciplinary strategy to watershed protection that encompasses watershed planning, watershed restoration, stormwater management, watershed research, better site design, education and outreach, and watershed training.



Native plantings using backyard conservation techniques are good for the watershed. Photo by Scott Williams.

Southern rivers watershed programs

The Southern rivers watershed encompasses the southernmost part of Virginia and includes eight sub-watersheds. Portions of the Southern Rivers watershed area drain into North Carolina's Albemarle-Pamlico Sound. However, Virginia's westernmost rivers eventually drain to the Mississippi River.

Big Sandy Watershed and the Russell Fork River Connection Project

The Big Sandy watershed covers 11,012 square miles. The Levisa Fork and Russell Fork rivers dominate this region's hydrology. With abundant rainfall in this region, the rivers and tributaries run deep and swift, carving this landscape and creating deep hollows and tall ridges.

Collaboration between the Elkhorn City Area Heritage Council, the National Trust for Historical Preservation, the National Park Service: Rivers, Trails and Conservation Assistance Program, and the 606 Studio design team at California State Polytechnic University, Pomona, resulted in a June 2005 study entitled *The*

Russell Fork River Connection: An Interstate Trail and Open Space Conceptual Plan. The Russell Fork River region within the Big Sandy watershed was studied to identify issues, opportunities and design recommendations for environmental, recreational and economic enhancement. Conceptual plans for a land and river trail including site and issue-based design responses are presented in the document. This document provides a framework to assess, analyze and respond to land planning opportunities and constraints; it is a timely first step towards building a healthy, vital and regenerative future for the region.

Tennessee Valley Authority

www.tva.gov

Through its Clean Water Initiative, which began in 1992, TVA builds partnerships with community residents, businesses, The Nature Conservancy, other nonprofits and government agencies to promote watershed protection. TVA's Watershed Teams are responsible for carrying out the program. They focus on improving water and shoreline conditions so that people and aquatic life can benefit from having clean water.

Virginia's Watershed Programs

EPA Albemarle-Pamlico National Estuary Program (APNEP)

www.apnep.org/pages/APNEPprogram.html

The Albemarle-Pamlico National Estuary Program—formerly known as the Albemarle-Pamlico Estuarine Study—was among the first National Estuary Programs established by the U.S. EPA in 1987. The mission of the APNEP is to identify, restore and protect the significant resources of the Albemarle-Pamlico estuarine system.

The APNEP is a cooperative effort jointly sponsored by the North Carolina Department of Environment and Natural Resources (DENR), the U.S. EPA and DCR. This unique program targets a broad range of issues and engages local communities in the process.

Chesapeake Bay and Coastal watershed programs

The Chesapeake Bay watershed includes part of six states (New York, Pennsylvania, Maryland, Delaware, Virginia, West Virginia) and the District of Columbia. In Virginia, the Chesapeake Bay watershed drains over 60 percent of the total land area and includes the watersheds of the James, Potomac-Shenandoah, Rappahannock and York rivers. A summary of Chesapeake Bay programs follows.

EPA Chesapeake Bay Program

www.chesapeakebay.net

This multijurisdictional partnership was established by the first *Chesapeake Bay Agreement* signed by the governors of Virginia and Maryland, the mayor of the District of Columbia, the administrator of the U.S. EPA and the Chairman of the Chesapeake Bay Commission in 1983. The focus of the agreement was to address nutrient over-enrichment, toxic pollution and the decline in underwater Bay grasses. Pennsylvania joined the partnership in 1985.

In 1987, the partners signed a second agreement and set additional goals; the most notable goal being a 40 percent reduction in nitrogen and phosphorus entering the Bay by 2000. In 1993, each partner agreed to develop tributary-specific strategies to achieve the nutrient reduction.

The Chesapeake 2000 Agreement (www.chesapeakebay.net/agreement.htm) was signed by Virginia and its partners in 2000 with more specific goals related to a variety of habitat, natural resource, public engagement and water quality commitments. In addition, the

“headwater states” of West Virginia, New York and Delaware agreed to participate in the implementation of the water quality commitments.

Chesapeake Bay and Virginia tributary strategies

www.naturalresources.virginia.gov/Initiatives/WaterQuality

In 2005, Virginia published *The Chesapeake Bay Nutrient and Sediment Reduction Tributary Strategy*. Current and future actions and projected costs are summarized in this document for Virginia's five major Chesapeake Bay river basins: Shenandoah-Potomac, Rappahannock, York, James and Bay Coastal. Detailed strategy documents have been developed involving local stakeholders within each of these watersheds and new watershed management tools are continually developed and integrated into these plans.

Virginia Coastal Zone Management Program

The Virginia Coastal Zone Management (CZM) Program helps governmental agencies, local governments and others develop and implement coordinated coastal policies. Virginia's coastal zone encompasses the 29 counties, 17 cities and 42 incorporated towns in Tidewater Virginia and all of the waters therein, and out to the three-mile Territorial Sea boundary. The coastal zone includes all of Virginia's Atlantic coast watershed as well as parts of the Chesapeake Bay and Albemarle-Pamlico Sound watersheds. A map of this area is provided.

Since 1986, the Commonwealth has received over \$48 million in federal funds, matched by over \$42 million in state and local funds, to implement the Virginia CZM Program. As a “maximum-funded state” Virginia receives about \$3 million annually (see chapter VI. Grant Opportunities for Outdoor Recreation and Open Space).

The Virginia CZM Program is part of a national coastal zone management program, a voluntary partnership between the federal government and the U.S. coastal states and territories authorized by the Coastal Zone Management Act of 1972. The Virginia CZM Program was established in 1986 and is reauthorized every four years by an executive order signed by Virginia's incoming governor. This executive order directs state agencies to carry out their legally established duties consistent with this Program and its ten goals. It also designates the Department of Environmental Quality as the lead agency for the networked program and outlines a conflict resolution process should any state actions be deemed inconsistent with the Program. This executive order is available on the program's website at www.deq.virginia.gov/coastal/exorder.html.

Map VII-8. Virginia Coastal Management Program Area



Virginia's Watershed Programs

Virginia CZM Program projects and programs that directly interface with goals and objectives of the VOP include:

- **Conservation corridors** include lands, typically along water bodies, that have been identified as priorities for protecting water quality and habitat or that provide opportunities for connecting these areas. Virginia CZM has helped establish corridors in the Hampton Roads area and will be providing assistance for developing conservation corridors in the remainder of the Coastal Zone.
- **Regional public access authorities** have been established for the Middle Peninsula and Northern Neck regions and are active in prioritizing access needs and sites and leveraging funds to acquire these sites. Virginia CZM has provided assistance to these authorities and will be working to establish and assist new authorities in the remainder of the Coastal Zone. Public access is the focus of a two-year project to be undertaken by a NOAA Coastal Management Fellowship Program Coastal Fellow who is working with the Virginia CZM Program and the Middle Peninsula Public Access Authority. The project, which began in August 2006, deals with improving public access information availability for the entire coastal zone and developing and implementing public access standards for the Middle Peninsula district.
- **Virginia CZM's Coastal Geospatial and Educational Mapping System (GEMS)** makes available online maps and information about the best remaining land and water based resources in Virginia's Coastal Zone, as well as many conservation tools. The website for this initiative is: www.deq.virginia.gov/coastal/coastalgems.html
- **The Coastal and Estuarine Land Conservation Program (CELCP)** provides federal funds for acquisition of important coastal lands. Virginia CZM is developing a CELCP plan that prioritizes lands for acquisition, in coordination with the organizations and agencies involved in land protection and resource protection planning in the Coastal Zone.
- **Ecotourism infrastructure** has been developed over the past five years using Virginia CZM funds for such things as a Seaside Water Trail, Ecotour guide and teacher certification course and construction of nine different projects involving a lighthouse renovation, three boardwalks, an observation platform, interpretive signage, four floating docks for canoes and kayaks. In addition, Virginia CZM and CELCP funds have funded 12 land acquisition projects that provide public access opportunities.

Virginia Coastal Zone Management Program enforceable policy areas

- Tidal and nontidal wetlands
- Fisheries
- Subaqueous lands
- Dunes
- Point source air pollution
- Point source water pollution
- Nonpoint source water pollution
- Shoreline sanitation
- Coastal lands (Chesapeake Bay Preservation Act)

Geographic areas of particular concern

- Spawning, nursery and feeding grounds
- Coastal sand dunes
- Barrier islands
- Significant wildlife habitat areas
- Significant public recreation areas
- Significant sand and gravel resource deposits
- Underwater historic resources
- Highly erodible and high hazard areas
- Waterfront development area



Saltmarshes are important spawning, nursery and feeding grounds. DCR photo by Irvine Wilson.